FP3: Coordinated Project - Multidisciplinary approach for a resilient Wellington CBD

Creating GIS-ready Building Inventory Dataset for Seismic Risk Assessment and Management

AIM

Building inventory database is created for Wellington, whose ultimate aim is to assist the generation of research on the risks, impacts, and viable solutions for reducing the seismic risk of existing multi-story concrete buildings in Wellington's CBD.

METHODS

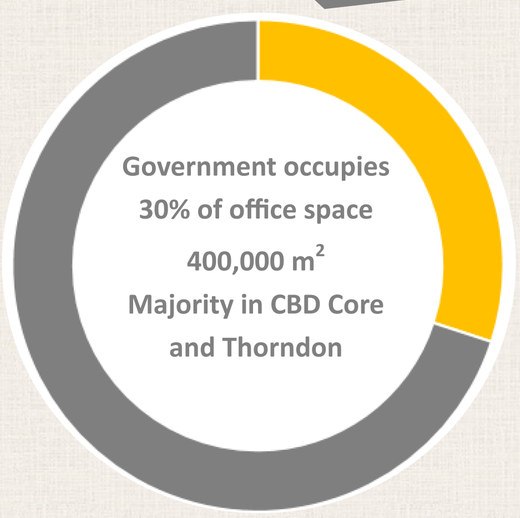
The inventory being constructed is embedded within a GIS viewer that will allow approved users access and visualise information directly on the viewer or to query and extract parts of the data inventoried to suit research needs.

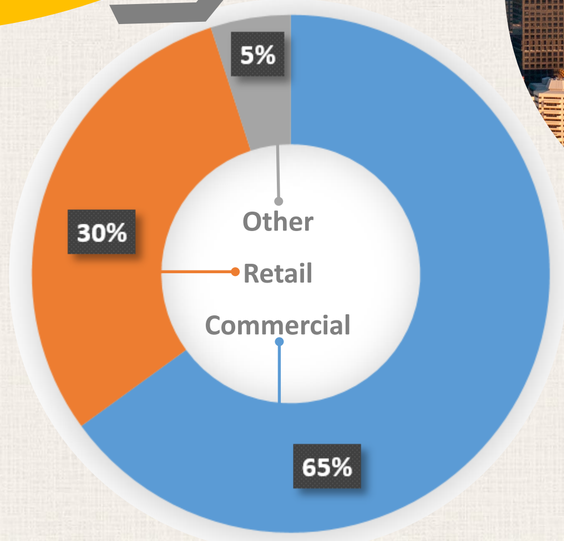
SOURCES

Multiple datasets are being sourced and combined in order to fill the gaps in the building inventory. Each dataset was originally created to address specific need (e.g. EQ-prone assessments). Therefore, there are significant variations in the attributes, terminology, representation of buildings, currentness.

VARIABLES

Building specific information contains spatial, structural, non-structural, occupancy and ownership details.





Projects Facts:

- **Building footprints** used as the base layer;
- **709** buildings in the scope and will be inventoried (>=12m);
- Structural system of the buildings is sourced from **5 WCC datasets** (EQPB assessments; TDE; hollow core; concrete columns; property file drawings);
- Building occupancy and use populated from **3 datasets**: Colliers Vacancy Survey, CityScope, WCC's District Valuation Roll;
- **Street collector app** developed in collaboration with WCC
- Web Feature Service: **Resilience Viewer** will allow users to query, visualise and extract data for bespoke analysis
- **Regular updates** to building inventory (e.g. refurbishment, strengthening, change of use, new occupants)

(A) BUILDING INVENTORY

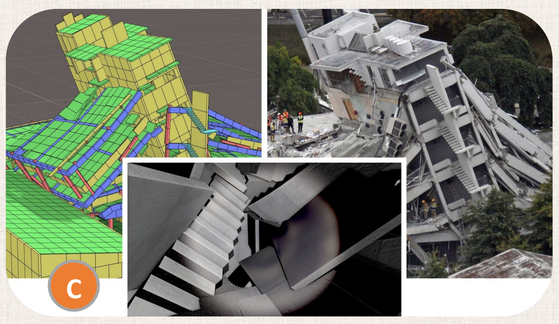
(B) Vulnerability of concrete building components – nonductile columns and precast floors

(C) Modeling of existing concrete buildings to assess collapse risk

(D) Cordoning and associated impacts

(E) Prioritisation of strengthening or demolitions of earthquake-vulnerable buildings

(F) Regulatory solutions for addressing earthquake-vulnerable buildings



Building (Earthquake-prone Buildings) Amendment Act 2016

F

Public Act	2016 No 22
Date of assent	13 May 2016
Commencement	see section 2

This project will provide fundamental research on risks, impacts, and solutions for multi-storey existing buildings in Wellington CBD, with a particular focus on buildings generally of concrete construction. Wellington property market will likely be heavily impacted by new seismic assessment guidelines due with many new assessments are likely to fall below 67%. Furthermore, densification of the CBD with 50,000 new residents in the next 20 years will result in conversion of many older commercial building stock to housing with a change in the risk profile for the city.

This project aims to provide best scientific knowledge about the expected seismic performance of concrete buildings (B,C), the impact of multiple building failures including the downstream consequences of associated cordoning (D), combined with innovative ideas regarding prioritization of retrofits (E) and optimised regulatory structure (F) to address the risk from earthquake vulnerable concrete buildings.

Absolutely Positively Wellington City Council
Me Heke Ki Pōneke

QuakeCoRE
NZ Centre for Earthquake Resilience
Te Hiranga Rū

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